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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/593,324	05/16/2007	Masahiro Takada	2006_1448A	7699

52349 7590 11/29/2010  
WENDEROTH, LIND & PONACK L.L.P.  
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Washington, DC 20005-1503

EXAMINER
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ECHELMAYER, ALIX ELIZABETH

ART UNIT	PAPER NUMBER
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1729

NOTIFICATION DATE	DELIVERY MODE
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11/29/2010

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ddalecki@wenderoth.com  
coa@wenderoth.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/593,324	<b>Applicant(s)</b> TAKADA ET AL.	
	<b>Examiner</b> Alix Elizabeth Echelmeyer	<b>Art Unit</b> 1729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 September 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/18/06, 4/15/09</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statement filed September 18, 2006 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed, specifically, no copy of JP 64-30174 is provided. It has been placed in the application file, but the information referred to therein has not been considered.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 4, and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Imamura et al. (US 2004/0033399).

Imamura et al. teach a fuel cell system comprising a fuel cell stack of individual fuel cells connected in series (abstract). Fuel and air supply devices are included in the system ([0016]).

Imamura et al. teach a controller for determining and controlling the air and fuel supply to the fuel cell stack (Figure 1, [0044], [0045]).

The controller of Imamura et al. controls the hydrogen supplied to the individual cells so that the voltage variation, or standard deviation from the average voltage for the stack, is minimized ([0012], [0013], [0060]).

Regarding claim 2, as discussed above, the system of Imamura et al. controls the fuel supply based on signals from the load and the fuel cells ([0045]). The skilled artisan will find that it is inherent in the system of Imamura et al. that, for conditions when the load is constant, the total input of fuel and air must be constant in order to prevent changes in the power output of the fuel cell system.

As for claims 4 and 5, since the controller of Imamura et al. calculates voltage deviation and the average value of voltages and controls the fuel supply based on those calculations, the controller of Imamura et al. is inherently capable of the limitations. For example, the controller of Imamura et al. determines whether the voltage deviation within a certain range, testing over intervals of time (Figure 6, [0072]).

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Imamura et al. as applied to claim 2 above, and further in view of Enjoji et al. (US 2004/0185315).

The teachings of Imamura et al. as discussed above are incorporated herein.

Imamura et al. teach a controller which receives inputs regarding the load and inputs from temperature measuring devices ([0095]). Imamura et al. fail to teach a table based on those inputs for determining the desired fuel supply amounts.

Enjoji et al. teach a controller which uses control values to control the air and hydrogen flow to a fuel cell stack ([0028], [0029]).

The controller of Enjoji et al. further comprises a data table with information of every possible load value and their relationships to temperature and other factors. The table is used to determine the control values discussed above ([0053]).

It would have been obvious to the skilled artisan at the time the invention was made to include a data table such as the table of Enjoji et al. in the controller of Imamura et al. in order to better control the reactant supply to the fuel cell stack, since better control of reactant supply increases efficiency, decreases waste, and protects the fuel cells from misuse by ensuring that they are operated properly.

6. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imamura et al. as applied to claim 1 above, and further in view of Kozu et al. (US 2005/0014043).

The teachings of Imamura et al. as discussed above are incorporated herein.

Imamura et al. teach a fuel cell system for providing power to a load but fail to teach a power converter for controlling the voltage or current of the fuel cell stack.

Kozu et al. teach a power converter for converting the power output from a fuel cell stack for use in supplying the power to a load (abstract).

Kozu et al. further teach that the power converter controls the output of the fuel cell stack based on the target value determined by the load. The power converter controls the output within a desired range of current and voltage,, and also communicates the target power to the controller for control of the voltage and current (Figure 4, [0129]).

As for claim 7, the controller inherently controls the amount of reactant supplied to each cell based on the desired power because the controller seeks to minimize standard deviation.

It would have been obvious to the skilled artisan at the time the invention was made to use a power converter such as the power converter of Kozu et al. in the system of Imamura et al. in order to provide better control of the power output of the fuel cell stack, since that would increase efficiency by not creating too much or too little power for the load.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is (571)272-1101. The examiner can normally be reached on Mon-Fri 7-4:30.

Art Unit: 1729

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ula Ruddock can be reached on 571-272-1481. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ula C Ruddock/  
Supervisory Patent Examiner, Art Unit 1795

Alix Elizabeth Echelmeyer  
Examiner  
Art Unit 1729

aee